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Bramwell et al.

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(54) **MOVEMENT INSTRUCTION USING A MIRROR IN AN ARTIFICIAL REALITY ENVIRONMENT**

(56) **References Cited**

U.S. PATENT DOCUMENTS

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6,842,175	B1	1/2005	Schmalstieg et al.
8,970,692	B2	3/2015	Tiao et al.
9,183,676	B2	11/2015	McCulloch et al.
9,213,413	B2	12/2015	Kauffmann et al.
9,256,072	B2	2/2016	Lyren
9,269,157	B2	2/2016	Saban et al.
9,325,943	B2	4/2016	Wilson et al.
9,569,899	B2	2/2017	Lyren
9,615,081	B2	4/2017	Torma
9,641,805	B2	5/2017	Wilson et al.

(Continued)

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OTHER PUBLICATIONS

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U.S. Appl. No. 16/454,438, by Bramwell et al., filed Jun. 27, 2019.

(Continued)

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(58) **Field of Classification Search**

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See application file for complete search history.

(57)

ABSTRACT

This disclosure describes an artificial reality system that presents artificial reality content in the context of a physical environment that includes a mirror or other reflective surface. In one example, this disclosure describes a method that includes capturing capture data representative of a physical environment, wherein the physical environment includes a reflective surface and a plurality of objects, determining a pose of the HMD, determining a map of the physical environment, wherein the map includes position information about the reflective surface and position information about each of the plurality of physical objects in the physical environment, identifying a visible object from among the plurality of physical objects, and generating artificial reality content associated with the visible object.

17 Claims, 14 Drawing Sheets

